

# Vaccine Preventable Diseases Other than COVID-19: An Update

Sean P. Elliott, MD, FAAP, FPIDS

Emeritus Professor of Pediatrics

The University of Arizona College of Medicine

Pediatric Infectious Diseases – TMCOne

Medical Director – Infectious diseases and Immunizations, AzAAP

# Disclosures:

- No financial disclosures
- I do not intend to discuss unapproved/investigative use of commercial products

# Learning Objectives:

- Learn the presentation, risk, and preventative management of Monkeypox virus infection
- Identify important updates in prevention and epidemiology of current vaccine-preventable infections that pose a risk to people living in Arizona (or immigrating to Arizona)

# Monkeypox virus



- Orthopoxvirus (smallpox & cowpox)
- Central & West Africa
- International travel (2021, Nigeria)
- Animal importation (2003, prairie dogs)
- Today...





# Monkeypox virus

- Fever
- Rigors
- Lethargy
- Headache
- Lymphadenopathy
- Myalgias
- New rash
- Proctitis
- EPIDEMIOLOGIC Contact!!



From Basgoz N, Brown CM, Smole SC, et al. Case 24-2022: A 31-Year-Old Man with Perianal and Penile Ulcers, Rectal Pain, and Rash. Epub ahead of print. Copyright © Jun 13 2022. Massachusetts Medical Society. Reprinted with permission from Massachusetts Medical Society

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# Monkeypox virus – Differential Dx





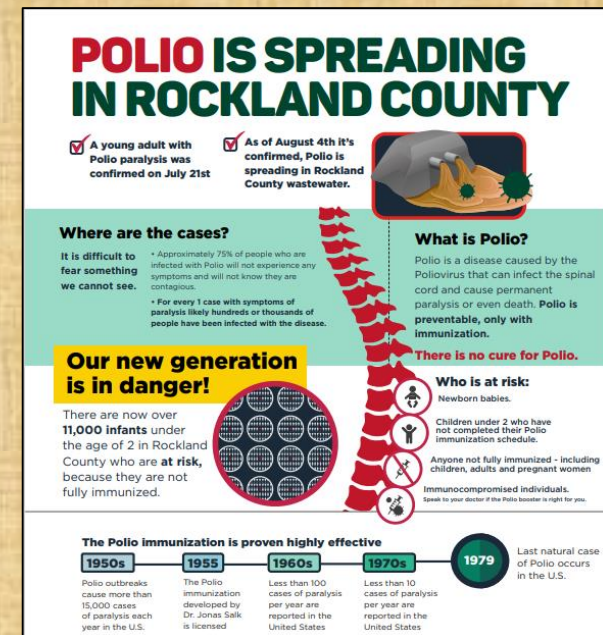
# Monkeypox virus

- Infection Prevention
- Testing:
  - 520-724-7797
  - Commercial labs
  - 2 lesions, 2 swabs
- Vaccination:
  - JYNNEOS
  - ACAM2000
  - PEP+, PEP++
  - **Pediatrics regimen**
- Treatment: TPOXX



# Polio

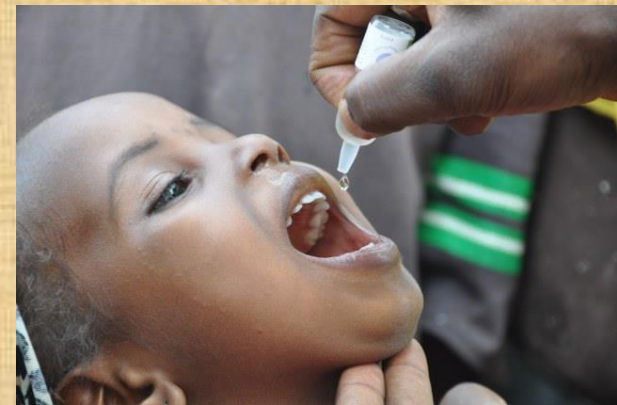
- 1<sup>st</sup> confirmed case – Rockland County, NY
- Presumed 100's active cases
- Strong signal – sewage testing
- Vaccine coverage – 2 y.o.:
  - U.S.A. 93%
  - Rockland County: 60%
- CDC team on-site:
  - Testing for new cases
  - Education/Communication
  - Vaccine boosters





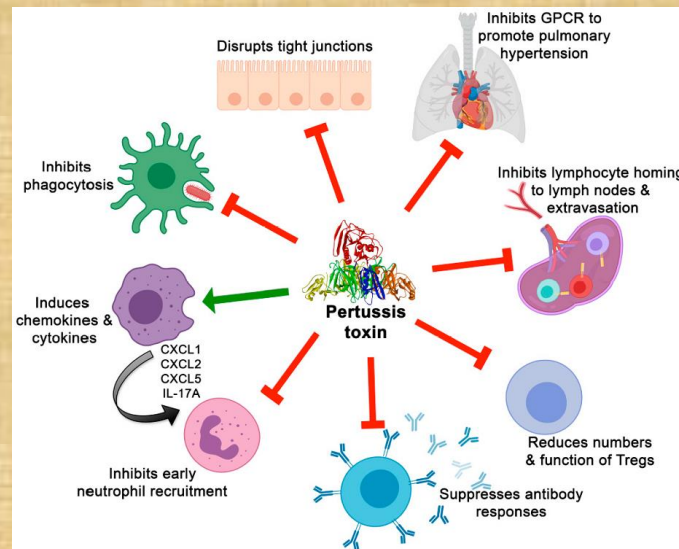
# Polio

- Clinical:
  - 75% asymptomatic (+ contagious)
  - 25% sore throat, H/A, etc.
  - 1/200 paralysis
- 1940's:
  - Active polio outbreaks
  - 35,000/year paralyzed
- 1955 vaccine campaign
- Today:
  - IPV – 4 doses, 99% effective
  - OPV – strains in stool, vaccine-derived polio



# Pertussis

- “100 day cough”
- Incubation: 7 – 10 days
- Catarrhal phase
- Cough phase
- Treatment efficacy?





# Measles

- “Three C’s”
- Severe – disseminated
- SSPE



## Measles

IT ISN'T JUST A LITTLE RASH



Measles can be dangerous, especially for babies and young children.

### MEASLES SYMPTOMS TYPICALLY INCLUDE

- High fever (may spike to more than 104° F)
- Cough
- Runny nose
- Red, watery eyes
- Rash breaks out 3-5 days after symptoms begin



### Measles Can Be Serious



About 1 out of 4 people who get measles will be hospitalized.



1 out of every 1,000 people with measles will develop brain swelling due to infection (encephalitis), which may lead to brain damage.



1 or 2 out of 1,000 people with measles will die, even with the best care.

### You have the power to protect your child.



Provide your children with **safe and long-lasting protection** against measles by making sure they get the **measles-mumps-rubella (MMR) vaccine** according to CDC's recommended immunization schedule.

[WWW.CDC.GOV/MEASLES](http://WWW.CDC.GOV/MEASLES)

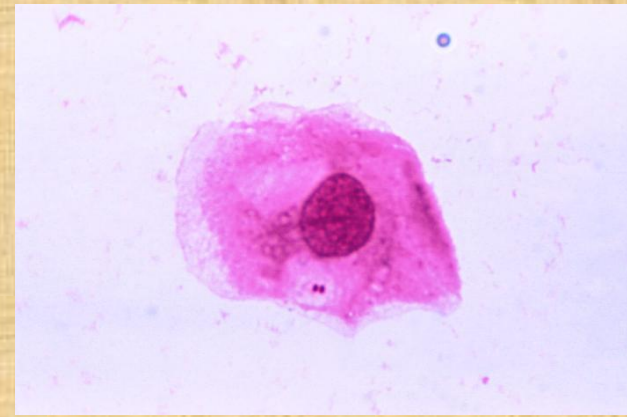




# *Neisseria meningitidis*



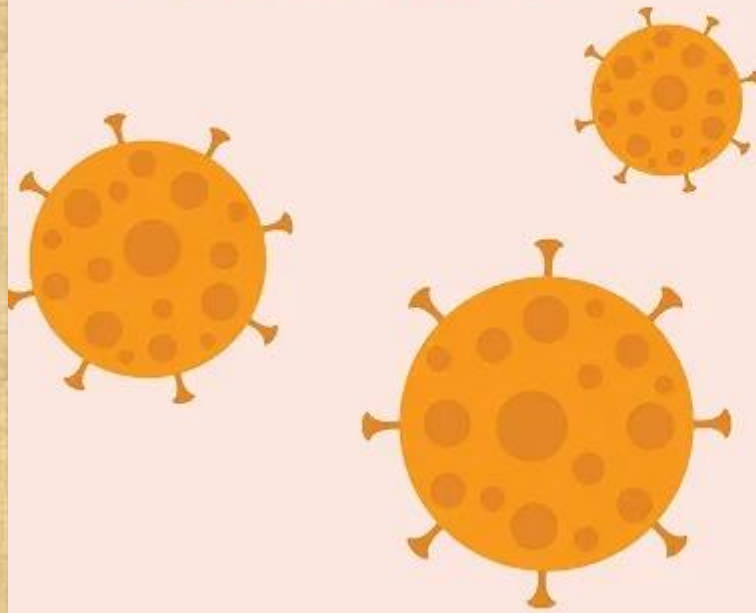
- Vaccines:
  - A, C, Y, W135
  - B
- Who?



# Respiratory Syncytial Virus

## Do You Know?

**Respiratory syncytial virus** (RSV) is a common respiratory virus that infects the nose, throat, lungs, and breathing passages



# RSV

- Paramyxovirus
- Associated with childhood disease in 1957
- Produces fusion of human cells in culture (syncytial effect)
- Two subtypes: A\* & B
- Transmitted by direct contact with nasal secretions, (droplets)
- Contaminated fomites
  - RSV epidemic
  - 33% uninfected, hospitalized children acquire RSV
  - Prolongation of hospitalization



# RSV - Vaccines

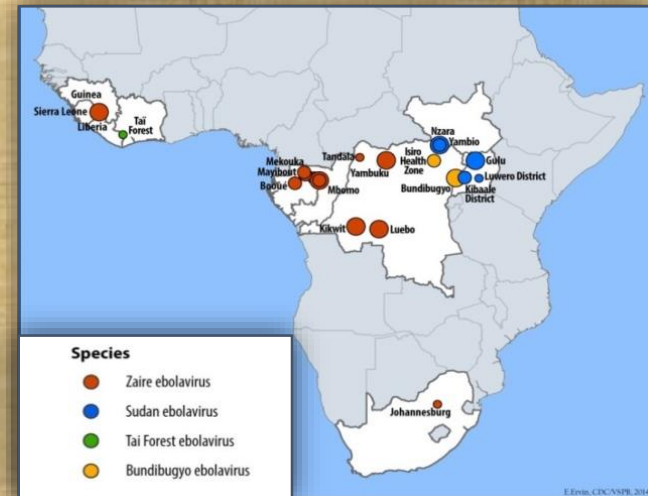
- Initial Vaccine research
- Adult vaccine – Pfizer & GlaxoSmithKline
  - FDA approved  $\geq 60$  years old
- Vaccine – pregnancy
  - Pfizer: RSVpreF
  - 82% effective for infants 0 – 90 days
  - FDA review
- “Vaccine” – mAb
  - Infants & toddlers < 2 y.o.
  - 75% reduction in hospitalizations and ICU admits
  - Palivizumab, Motavizumab, Nirsevimab

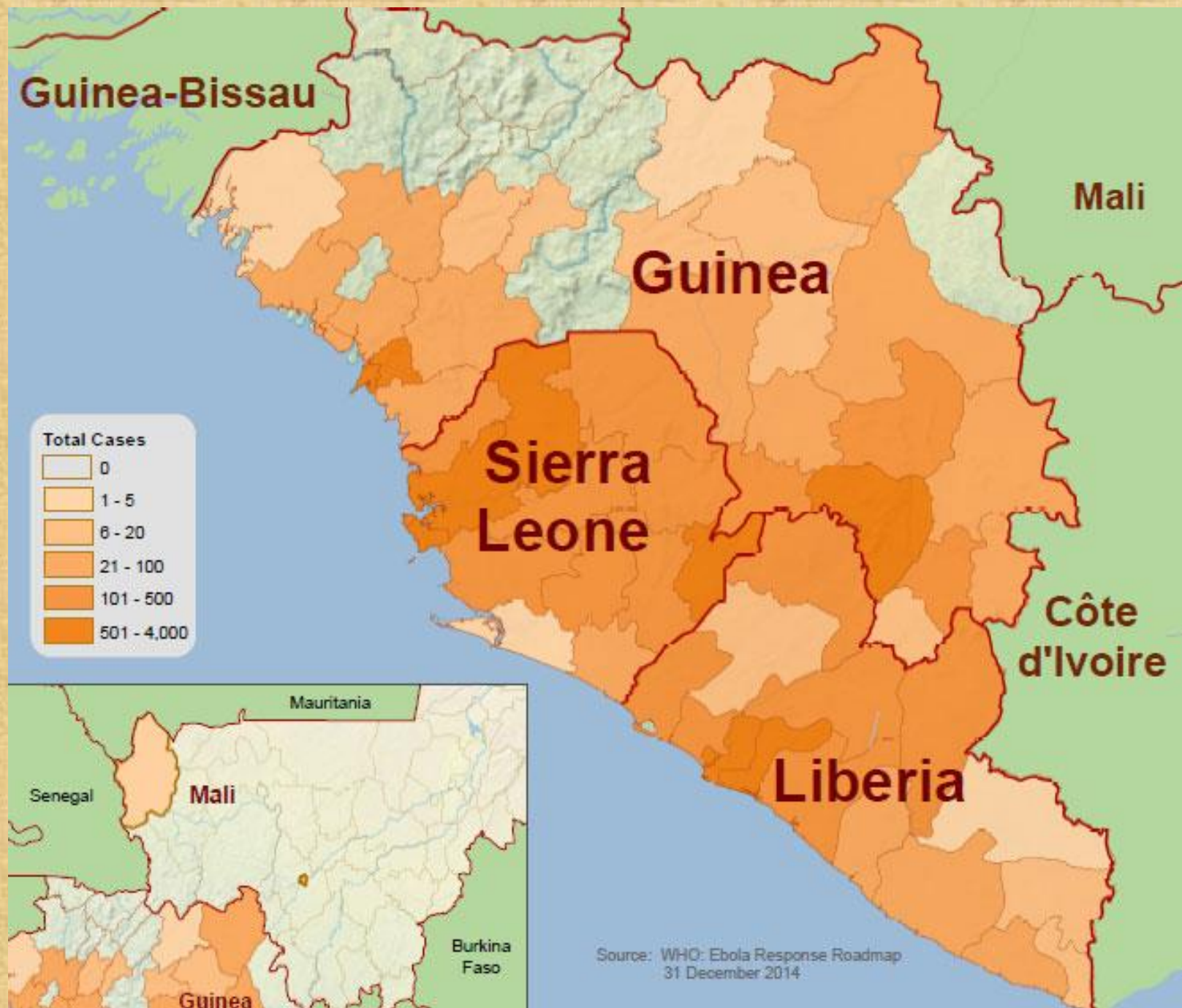
# Ebola Virus

- Prototype Viral Hemorrhagic Fever Pathogen
  - Filovirus: enveloped, non-segmented, negative-stranded RNA virus
  - Severe disease with high case fatality



- >25 previous Ebola and Marburg virus outbreaks
- 2014 West Africa Ebola outbreak caused by *Zaire ebolavirus* species (five known Ebola virus species)







# EVD Case Counts – Spring, 2016

## Countries with Widespread Transmission

Country	Total Cases	Confirmed Cases	Total Deaths
Guinea	3804	3351	2536
Liberia	10675	3160	4809
Sierra Leone	14123	8705	3956
<b>Total</b>	<b>28602</b>	<b>15216</b>	<b>11301</b>

## Countries with an Initial Case or Cases and/or Localized Transmission

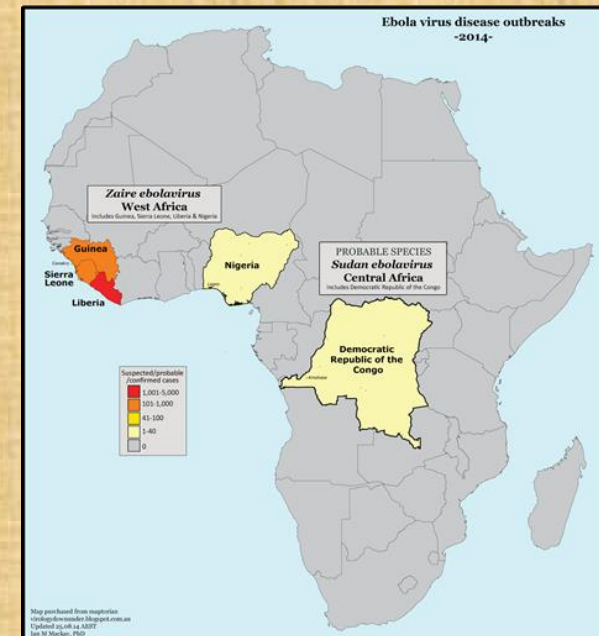
Country	Total Cases	Confirmed Cases	Total Deaths
United States	4	4	1
Mali	8	7	6
United Kingdom	1	1	0
<b>Total</b>	<b>13</b>	<b>12</b>	<b>7</b>

## Previously Affected Countries

Country	Total Cases	Confirmed Cases	Total Deaths
Nigeria*	20	19	8
Senegal*	1	1	0
Spain*	1	1	0
<b>Total</b>	<b>22</b>	<b>21</b>	<b>8</b>

# EVD

- Democratic Republic of Congo
  - 3461 cases, 2277 deaths
  - Isolated epicenter
  - Militia violence
  - Robust WHO response
  - Ring vaccine strategy
- Uganda – Sept. 20, 2022

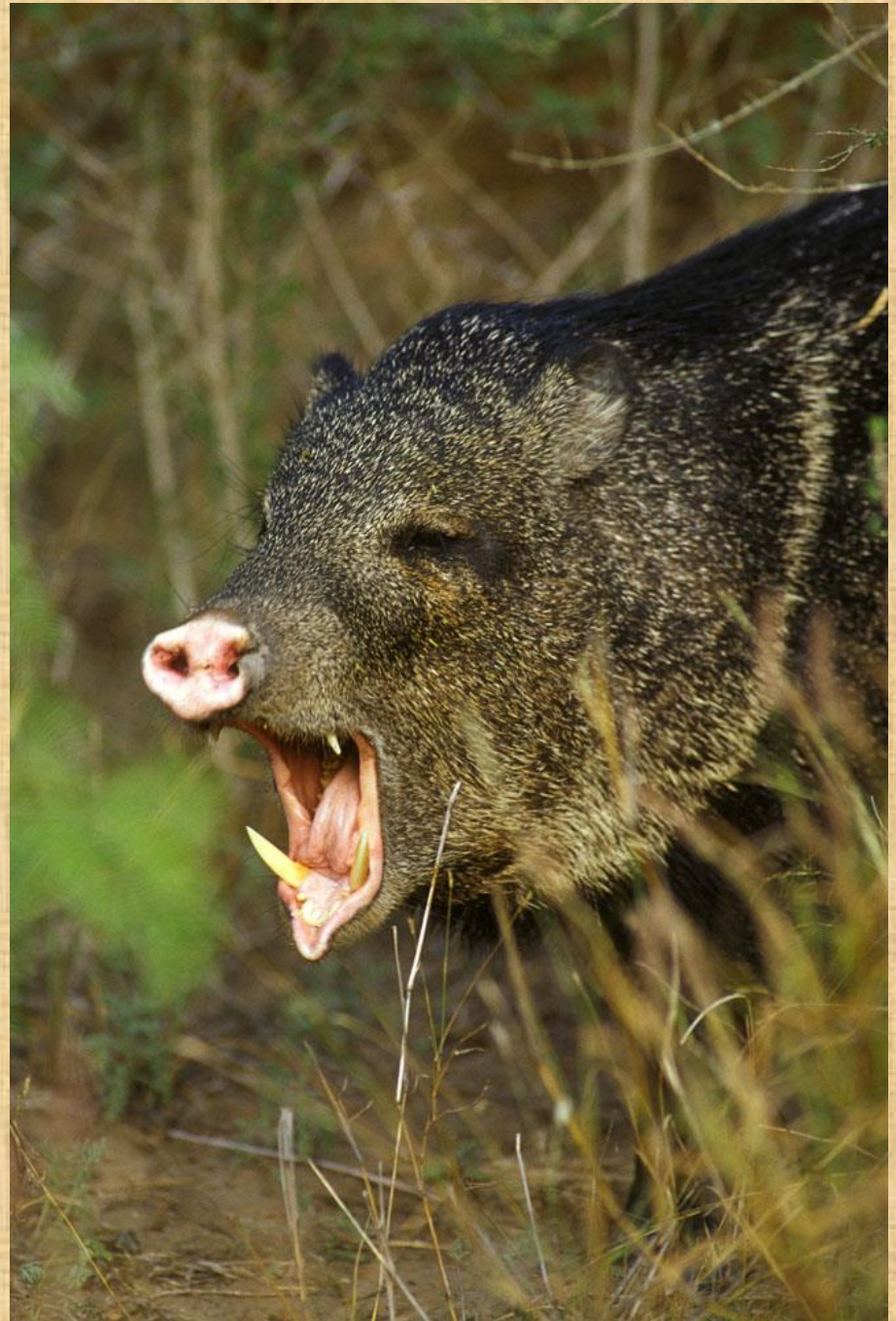


# Investigational Therapies for EVD Patients

- Ribavirin: NO proven benefit
- Other interventions:
  - Convalescent serum
  - Therapeutic medications
    - Zmapp – chimeric human-mouse monoclonal antibodies
    - Tekmira – lipid nanoparticle small interfering RNA
    - Brincidofovir – oral nucleotide analogue with antiviral activity
- Vaccines
  - Chimpanzee-derived adenovirus with an Ebola virus gene inserted
  - Attenuated vesicular stomatitis virus with an Ebola virus gene inserted: RING VACCINATION STRATEGY!



When good Javelinas  
go bad...



# Javelina facts

- *Pecari tajacu*
- Peccary family:
  - Hoofed mammals
  - S. America
- Omnivores
- Canines, coyotes = natural predators
- Very poor eyesight!
- Charge vs. escape
- Risk of a bite?

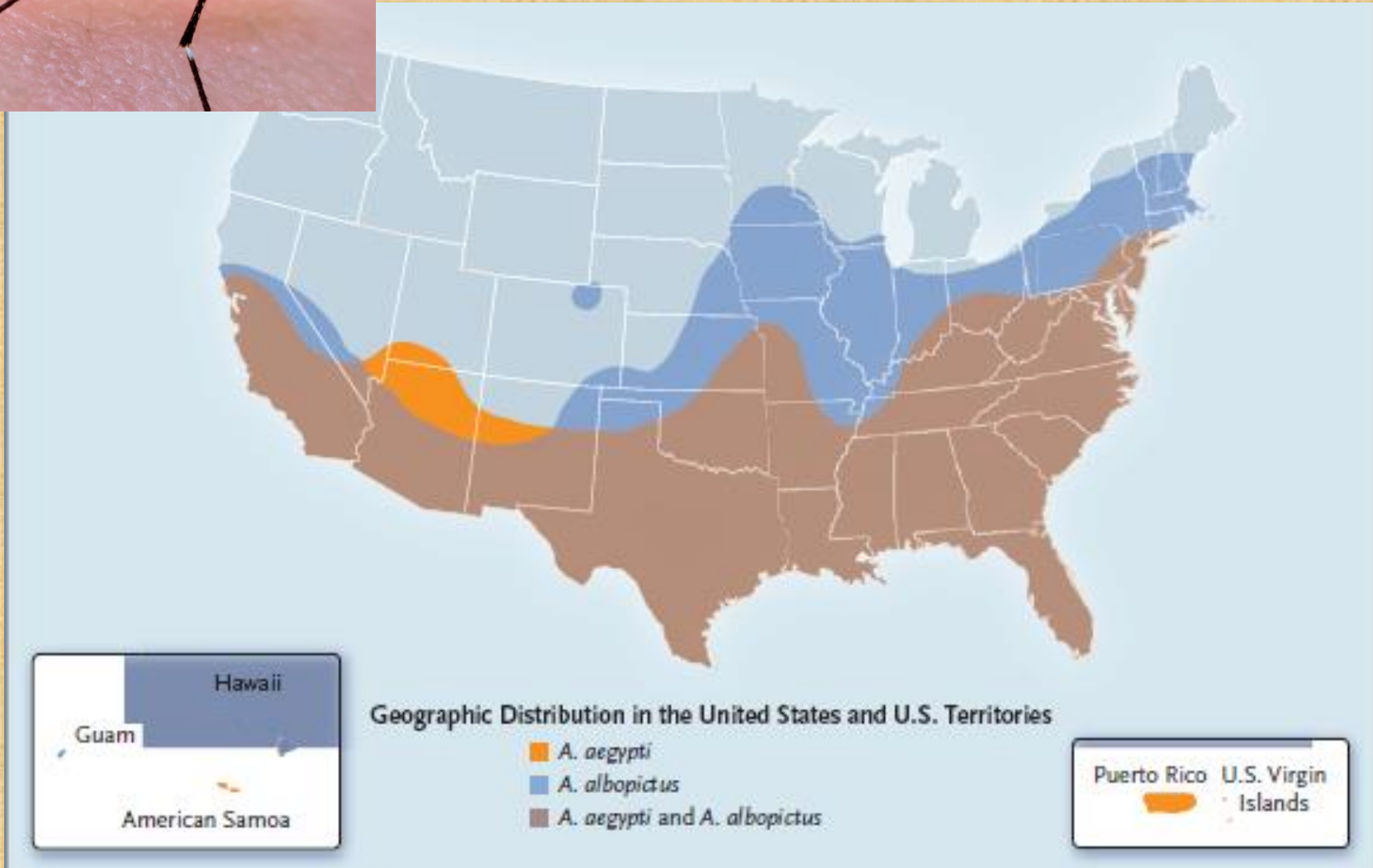
# Javelina and infection

- Rabies:
  - Mostly symptomatic
  - Erratic/aggressive/hyperactive behavior
  - Fearful/lethargic behavior
  - Paralysis
  - Hydrophobia
  - Foaming at mouth
  - Transmissible to humans!



# Javelina and infection

- Javelina bite:
  - Pets: quarantine
  - Humans:
    - Rabies prophylaxis?
    - Prophylactic antibiotics?
- Infected javelina bite:
  - Surgical evacuation
  - Empiric, broad-spectrum antibiotics
  - Culture-driven management



Geographic Distribution in the United States and U.S. Territories

- *A. aegypti*
- *A. albopictus*
- *A. aegypti* and *A. albopictus*

Puerto Rico U.S. Virgin Islands

# Aedes mosquito carriage

- Chikungunya
  - Tanzanian: “that which bends up”
  - Fever: 40° C X 3 – 5 days
  - Polyarthralgias: distal > proximal (hands & feet)
- Dengue
  - “Break bone fever”
  - Fever
  - Retro-orbital headaches
  - Polyarthralgias
  - Rash 50%
  - Hemorrhagic complications





# Questions?

